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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/854,092	05/10/2001	Tony P. Chiang	PA1663US	7713

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EXAMINER	
MEEKS, TIMOTHY HOWARD	
ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 07/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/854,092	CHIANG ET AL.	
	Examiner	Art Unit	
	Timothy H Meeks	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) *16-43 and 48-51* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 44-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-51* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *701, 801* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

Applicant's election of claims 1-15 and 44-47 in Paper No. 0504 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 16-43 and 48-51 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention.

Priority

Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

> If applicant desires priority under 35 U.S.C. 120 based upon a previously filed application, specific reference to the earlier filed application must be made in the instant application. For benefit claims under 35 U.S.C. 120, 121 or 365(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of the applications. This should appear as the first sentence of the specification following the title, preferably as a separate paragraph unless it appears in an application data sheet. The status of nonprovisional parent application(s) (whether patented or abandoned) should also be included. If a parent application has become a patent, the expression "now Patent No. _____" should follow the filing date of the parent application. If a parent application has become abandoned, the expression "now abandoned" should follow the filing date of the parent application.

If the application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A priority claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed claim for priority under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was

unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

The first sentence does not provide the relationship of the recited nonprovisional applications to the instant application (i.e., continuation, divisional, or continuation-in-part), therefore, the conditions for claiming priority under 35 USC 120 have not been met.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Markush language is open and hence it is unclear what members it consists of. The phrase "a group" should be changed to "the group".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section

351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7, 14, and 44-46 are rejected under 35 U.S.C. 102(e) as being anticipated by Mercaldi (2003/0073308).

The process is disclosed at paragraphs 38 and 39. Specifically, the disclosed process involves heating the substrate from ambient temperature to a higher deposition temperature required for nucleation layer deposition but less than 550 °C. In such process, the substrate would be heated to each temperature from its ambient temperature when introduced in the process chamber for heating, which would include heating to 1st, 2nd, 3rd, 4th, etc. temperatures until the temperature for nucleation layer deposition is achieved. Please note that the claims do not require that the process steps occur in the sequence listed. Heating the substrate prior to deposition as described above would include all of the listed process steps, even though they are not performed in the order listed. As to claims 4-7, these temperatures would be reached in the step of heating the substrate to a temperature "less than 550 °C" but higher than "about 400 °C." (see range given for deposition layer depositing step described in paragraph 38). As to claims 2 and 45, lowering the temperature after the nucleation step to form the deposition layer would involve repeating the process and would also involve not heating to the 1 st temperature as the temperature wuld only be lowered to about 400 °C at the least (paragraph 38). As to claim 14, provision of metal oxide coatings is described at paragraph 20 which require a metal precursor.

Claims 1-7, 10, 14, and 44-46 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakuma et al. (5,270,247).

The process is disclosed at the abstract, figures 2 and 15, and description thereof in the specification. Specifically, the disclosed process involves heating the substrate from ambient temperature to a higher deposition temperature required for deposition of up to 450 °C. In such process, the substrate would be heated to each temperature from its ambient temperature when introduced in the process chamber for heating, which would include heating to 1st, 2nd, 3rd, 4th, etc. temperatures until the temperature for deposition is achieved. Please note that the claims do not require that the process steps occur in the sequence listed. Heating the substrate prior to deposition as described above would include all of the listed process steps, even though they are not performed in the order listed. As to claims 4-7, these temperatures would be reached in the step of heating the substrate to a temperature "up to 450 °C". As to claim 10, thermal heating by inductance is disclosed in figure 15 and specification description thereof. As to claims 2 and 45, Sakuma describes performing the ALD process at several deposition temperatures (figure 2). This would involve repeating the process and would not involve heating to "a first temperature" i.e., 1st temperature used during the first deposition. Please note that claims 2 and 45 do not require the process be repeated on the same substrate.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 8-13, 15 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mercaldi.

With respect to claims 8, 9, and 47, the ramp rates are not explicitly disclosed. However, because it would clearly be desirable to provide the substrate at the desired process temperature as quickly as possible to decrease process time and increase throughput, it would have been obvious to have used ramp rates in the claimed ranges as doing so would have been expected to decrease process time.

With respect to claims 10 and 11, Mercaldi discloses use of RTP at col. 46 as an effective heating method, hence use of such heating method would have been obvious in the deposition process with a reasonable expectation of successfully heating the substrate.

With respect to claims 12 and 13, as described in paragraph 38, the temperature needs to be lowered prior to depositing the deposition layer. To begin lowering of the temperature during the evacuation of the 1st gas or provision of the 2nd gas during the nucleation layer formation step would have been obvious to decrease process time.

With respect to claim 15, it would have been obvious to cool the substrate back to ambient temperature upon completion of the process to allow for removal of the substrate from the chamber and its subsequent processing or use. This cooling would clearly involve reaching the 1st temperature achieved when heating from ambient to processing temperature.

Claims 8, 9, 15 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma.

With respect to claims 8, 9, and 47, the ramp rates are not explicitly disclosed. However, because it would clearly be desirable to provide the substrate at the desired process temperature as quickly as possible to decrease process time and increase throughput, it would have been obvious to have used ramp rates in the claimed ranges as doing so would have been expected to decrease process time.

With respect to claim 15, it would have been obvious to cool the substrate back to ambient temperature upon completion of the process to allow for removal of the substrate from the chamber and its subsequent processing or use. This cooling would clearly involve reaching the 1st temperature achieved when heating from ambient to processing temperature.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. 2003/0031787 and 2003/0175423 are cited herewith as they appear to claim processes that are substantially similar to the instantly claimed process. These publications do not qualify as prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy H Meeks whose telephone number is 571-272-1423. The examiner can normally be reached on Mon, Wed, Thur 6-6:30, Fri 6-10.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on 571-272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Timothy H Meeks
Primary Examiner
Art Unit 1762

July 6, 2004
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